

**REMARKS**

Claims 22-41 are currently pending in this application. Claims 22, 23, 29, 31-36, and 40 have been amended. Claim 39 has been cancelled. Reconsideration of the above-identified application in view of the amendments to these claims and the following remarks is respectfully requested.

**I. Interview**

The courtesy extended by the Examiner in the interview of June 12 is acknowledged with appreciation. While no agreement was reached, the Examiner's comments on the current scope of the claims were helpful.

**II. Objection to Claims 22, 23, 33, and 35**

Claims 22, 23, 33, and 35 were objected to due to informalities. Each of these claims have been amended to correct the informalities described. It is thus respectfully requested that the objection be withdrawn.

**III. Rejection of Claims 22, 24, 34, 36, 38, and 39  
under 35 U.S.C. §102**

Claims 22, 24, 34, 36, 38, and 39 have been rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,108,346 to Doucette et al. (hereinafter, "Doucette"). Claim 34 has been amended to depend from claim 29, and will be discussed in conjunction with its base claim. Claim 36 has

been amended to include subject matter related to claim 29. Claim 36 and claim 38 will be discussed in relation to the 35 U.S.C. §103 rejections below. Claim 39 has been cancelled.

Claim 22, as amended, recites a system for transmitting and receiving one of T1 and E1 control data in a time division multiplexer (TDM) communication network. A master control source provides TDM control data. At least one slave TDM multiplexer has a plurality of associated local data sources. A given slave TDM multiplexer is being operative to produce a TDM signal, comprising a plurality of fixed-length frames, such that each of the plurality of associated data sources is represented by one of a plurality of fixed-length, recurrent time-slots of equal length comprising each of the plurality of frames. Each slave TDM multiplexer includes a transmitter component, having an associated transmit processor, for accepting the TDM control data from the master control source and inserting the TDM control data into at least a portion of one of the plurality of fixed-length, recurrent time-slots in each frame of the plurality of frames. The slave TDM multiplexers also include a receiver component for extracting the TDM control data from the TDM signal and passing the TDM control data to a local processor.

It is respectfully submitted that claim 22 defines patentable invention over U.S. Patent No. 6,108,346 to

Doucette (hereinafter: Doucette) because Doucette does not teach or suggest designating at least a portion of one channel, normally devoted to carrying data from a local data source, to carry control data in an information channel in a T1 or E1 system. Doucette describes a token ring arrangement that uses a series of tokens and control characters to moderate access among a plurality of modules. Specifically, control characters are used to indicate the start of a window, the end of synchronous data transfer and the end of a window. Tokens are used to signify which module presently has transmission rights during a given window. There is simply no teaching in Doucette of a signal having a fixed frame comprising a plurality of fixed-length, recurrent time slots of equal length associated with local sources. It is thus respectfully submitted that claim 22 is patentable over the cited art.

It is further submitted that Doucette, taken in combination with a standard T1 system, would not lead one skilled in the art to the claimed invention. The control information cited in the Office Action as taught by Doucette is the framing data in each frame used to control the timing in each frame. This framing data is carried outside of the data portions of the signal to denote the start and end of a frame, as well as the transition from synchronous to

asynchronous data. The additional element of "equal length" has been added to claim 22 specifically to emphasize the placement of control data to the time slots reserved for data in prior art systems, as opposed to smaller portions of the frame that are reserved for timing and framing information.

It is respectfully submitted that one skilled in the art, presented with Doucette and a standard T1 system, would not seek to insert control data in at least a portion of one of a plurality of fixed-length, recurrent time slots of equal length that carry data in a T1/E1 system. Doucette teaches the transmission of timing and framing information within a frame, but all of this information is outside of the portion of the frame traditionally reserved for transmitting data from local sources. T1 systems already have framing data within the frame but outside of the data channels; Doucette provides no new suggestion in this regard.

One skilled in the art would further be discouraged from incorporating the timing and framing information from Doucette into a data slots, as this information is necessary for recovering the data stored in the plurality of time slots. A hypothetical modification of Doucette to read on the claimed invention would require that the modified system provide timing and framing information in the very data channels that the framing information is needed to decode. Doucette would

thus not lead one skilled in the art to insert control information into one of the data channels, specifically, one of the plurality of equal-length time slots within a frame that reoccur at a fixed length across the frames in a E1 or T1 system.

Claim 24 depends from claim 22 and is allowable for at least the same reasons. It is thus respectfully submitted that claims 22 and 24 are allowable over the cited art, and the withdrawal of the rejection of these claims is respectfully requested.

**IV. Rejection of Claims 23, 25-33, 35, 37,  
and 40-41 under 35 U.S.C. §103**

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**A. Claims 27 and 28**

Claims 27 and 28 have been rejected as unpatentable over Doucette under 35 U.S.C. §103(a). Claims 27 and 28, which depend from claim 22, recite, respectively, that the control data is inserted within a fraction of a time slot or multiple time slots. The Office Action states that this would be obvious in light of the teachings of Doucette, to allow the necessary bandwidth for the control data to be allocated dynamically to conserve bandwidth within the system.

It is respectfully submitted that Doucette does not suggest the use of fractional or multiple fixed time slots. Even if Doucette taught the use of control data within a slot

associated with a data source, the "slot" allocated to a given data source in Doucette is variable in length, and could thus accommodate any amount of control data without the need for fractional or multiple data slots. Accordingly, one skilled in the art, confronted with Doucette, would not be lead to the use of fractional or multiple time slots for carrying control data as recited in claims 27 and 28.

It is further submitted that the proposed motivation for the modification is flawed, and would not inspire one skilled in the art to make the stated modification. In the claimed system, each channel (i.e., reoccurring fixed-length time-slot) is already assigned to a data source, with a fraction of a channel or multiple channels being allocated to control data. Altering the allocation represents a non-trivial processing expense that would likely outweigh any gain in bandwidth. Further, the framing information in Doucette relied upon in the Office Action as control data is, by necessity, of fixed length. To the extent that the length of the framing data could be dynamically altered, it would require constant reconfiguration of the multiplexers within the system to recognize the framed data. In fact, no data from the signal could be read accurately until this reconfiguration took place. It is thus respectfully submitted that claims 27 and 28 recite patentable invention over the

cited art, both for the reasons described above as well as for the reasons described with respect to claim 22.

B. Claims 23, 29-31, and 34-38

Claims 23, 29-31, 35, and 37 have been rejected as unpatentable under 35 U.S.C. §103(a) over Doucette in view of U.S. Patent No. 6,636,529 to Goodman et al. (hereinafter: "Goodman"). Claim 36 has been amended to contain subject matter that is similar to that of claim 29, and will be discussed in light of Goodman. Claim 38 depends from claim 36. It is respectfully submitted that these claims define patentable invention over the cited art.

Claim 29 recites a system for transmitting and receiving time division multiplexer (TDM) control data in a time division multiplexer (TDM) communication network. A master control source provides the TDM control data. A first slave TDM multiplexer within the TDM communications network accepts the TDM control data from the master control source and inserts the TDM control data into a TDM signal. A second slave TDM multiplexer, comprising a transmitter component having an associated transmit processor and a receiver component having an associated receive processor, is configured to operate in a bridging mode such that the TDM signal from the first slave multiplexer is received at the receiver component, bridged to the transmitter component, and

retransmitted independently of the transmit processor and the receive processor. A third slave TDM multiplexer receives the TDM signal from the second slave TDM multiplexer and extracts the TDM control data in the TDM signal.

It is respectfully submitted that Doucette and Goodman, taken alone or in combination, fail to teach or suggest the use of a bridging component to relay control data between multiplexers independently of local processing. In Doucette, each byte, including tokens and control characters, is received at a modules, copied internally, and passed onto the next module only if appropriate. See Doucette, Col. 3, lines 34-42. Accordingly, every character must be processed at the module before it can be passed to the next module. In the claimed invention, there is no need for processing or recognition of the data; the data is sent along, as received, regardless of its content. The data is not read at a receive processor prior to retransmission, and the data is not reformatted at a transmit processor. Doucette does not teach or suggest relaying control information independently of the local processor.

Goodman also fails to provide this teaching. Goodman describes a signal converter that identifies a line code of an incoming signal, converts the signal into an appropriate synchronous format, and retransmits the signal. Given the



large amount of processing, both in recognizing the signal and in converting the signal into a desired format, one skilled in the art would not read Goodman to provide a suggestion of retransmitting a signal independently of the transmit processor and the receive processor, as recited in claim 29. Both Goodman and Doucette provide systems in which processing of the signal is necessary prior to retransmission; there is no teaching of processor independent processing. It is thus respectfully submitted that claim 29 defines patentable invention over the cited art.

Claim 23, which depends from claim 22, and claim 35, which depend from claim 29, recite the use of first and second FIFO buffers to allow a TDM signal to be relayed across a slave TDM multiplexer without synchronization by the transmit processor and the receive processor. As discussed previously, Goodman does not teach this passive synchronization and retransmission of a signal using its buffers. The buffers in Goodman are simply used to accumulate signal data until headers can be added. In fact, Goodman describes a buffer fill monitor (Fig. 5, 550) that actively controls the synchronization of the signal with the buffer. Accordingly, one skilled in the art would not be lead by the teachings of Goodman to a system in which buffers are used to relay a signal "without synchronization by the transmit processor and

the receive processor" as recited in the claims. As the Office Action notes, Doucette also fails to provide this teaching. It is thus respectfully submitted that claims 23 and 35 recited patentable invention over the cited art.

Claim 36 recites a method for distributing time division multiplexer (TDM) control data within a time division multiplexing (TDM) communications network comprising a plurality of TDM multiplexers. TDM control data, comprising at least one of configuration data for one of the plurality of multiplexers and status information associated with the TDM communications network, is generated at a master control source. The TDM control data is received at a first TDM multiplexer. At least a portion of the received control data is inserted into a TDM signal at the first TDM multiplexer. The TDM signal is received at a second TDM multiplexer that is configured to operate as a repeater. The TDM control signal is retransmitted concurrently with and independently of evaluation of its content at a local processor associated with the second TDM multiplexer, such that the TDM signal is retransmitted in a substantially unaltered form regardless of its content. The TDM control data is extracted from the TDM signal at a third TDM multiplexer and provided to a TDM multiplexer control processor associated with the third TDM multiplexer.

Doucette does not teach or suggest retransmitting a signal, containing control data, at a slave multiplexer independently of any evaluation of the signal. Doucette passes on control characters as it receives them, but to do so, it must first identify the characters as control characters. The method recited in claim 36 retransmits the entire TDM signal while the control data is still being extracted and processed. As discussed previously, Goodman also fails to teach or suggest a system in which a signal is retransmitted independently of any evaluation or modification of the signal. In fact, identification and modification of a received signal is central to the Goodman system. Accordingly, it is respectfully submitted that claim 36 recites patentable invention over the cited art.

Claim 30 and 31 depend from claim 29, and are allowable for at least the reasons described with respect to that claim. Claim 37 depends from claim 36 and is allowable for at least the reasons discussed with respect to that claim. It is thus respectfully submitted that claims 23, 29-31, 35, and 37 define patentable invention over the cited art, and the withdrawal of these claims is respectfully submitted.

C. Claims 25-26, 32-33, and 40-41

Claims 25, 26, 40, and 41 have been rejected as unpatentable over Doucette in view of U.S. Patent No.

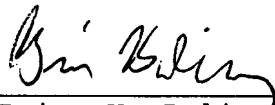
6,370,159 to Eidson (hereinafter, "Eidson"). Claims 32-33 have been rejected as unpatentable over Doucette in view of Goodman in further view of U.S. Patent No. 6,188,699 to Lang et al. (hereinafter, "Lang"). Edison and Lang do not remedy the deficiencies of Doucette and Goodman with respect to claims 22, 29, and 36 described above. Claims 25-26, 32-33, and 40-41 each depend, either directly or indirectly, from one of claims 22, 29, and 36, and are allowable for at least the reasons set forth with respect to their respective base claims. It is thus respectfully submitted that these claims define patentable invention over the cited art and their withdrawal is respectfully requested.

**V. Conclusion**

In light of the amendment and remarks above, it is submitted that claims 22-38 and 40-41 are allowable over the cited art. Allowance of the subject application is respectfully requested.

Please charge any deficiency or credit any overpayment in  
the fees for this amendment to our Deposit Account  
No. 20-0090.

Respectfully submitted,



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Brian W. Bolinger  
Reg. No. 47,434

TAROLLI, SUNDHEIM, COVELL,  
& TUMMINO L.L.P.  
1300 East Ninth Street, Suite 1700  
Phone: (216) 621-2234  
Fax: (216) 621-4072  
Customer No. 26294